What is claimed is:

1. A method for preparing a microfluidic device for operation, the method comprising the steps of:

providing a microfluidic device having a fluidic inlet, at least one fluidic outlet, a plurality of microfluidic channels disposed between the fluidic inlet and the fluidic outlet, and separation media disposed within at least one microfluidic channel of the plurality of microfluidic channels, between the fluidic inlet and the fluidic outlet, with at least one microfluidic channel of the plurality of microfluidic channels containing a gas;

providing a vacuum source in at least periodic fluid communication with at least one of the fluidic inlet and the at least one fluidic outlet;

providing a positive pressure source in at least periodic fluid communication with the fluidic inlet;

evacuating the gas from the microfluidic device using the vacuum source; and

introducing a liquid into the microfluidic device through the inlet using the positive pressure source.

2. The method of claim 1, further comprising the step of temporarily sealing the fluidic inlet prior to the evacuation step.

3. The method of claim 1 wherein the gas comprises air.

4. The method of claim 1 wherein the separation media comprises packed or microporous stationary phase material.

5. The method of claim 1 wherein the device further comprises a hydrophobic frit material.

6. The method of claim 1 wherein the liquid is an organic solvent selected from the group consisting of acetonitrile, methanol, isopropyl alcohol, ethanol, ethyl acetate, and dimethyl sulfoxide.

7. The method of claim 1, further comprising the step of disallowing fluid communication between the vacuum source and at least one of the fluidic inlet and the at least one fluidic outlet prior to the liquid introduction step.

8. The method of claim 1 wherein the temporarily sealing step includes operating a valve.

9. The method of claim 1 wherein the vacuum source comprises a vacuum pump.

10. The method of claim 1 wherein the positive pressure source comprises a liquid pump.

11. The method of claim 1 wherein the liquid introduction step includes supplying liquid pressurized to at least about 100 psi to the microfluidic device.

12. The method of claim 1 wherein:

the microfluidic device has a plurality of fluidic outlets;

the vacuum source is in fluid communication with at least two fluidic outlets of the plurality of fluidic outlets; and

the gas is evacuated from the microfluidic device through the at least two fluidic outlets.

13. A microfluidic system comprising:

a microfluidic device having a fluidic inlet, a plurality of fluidic outlets, a microfluidic distribution network, a plurality of microfluidic separation columns containing stationary phase material and in fluidic communication with the plurality of fluidic outlets and in fluid communication with fluidic inlet through the distribution network;

a vacuum source in at least periodic fluid communication with the plurality of separation columns; and

a positive pressure source in at least periodic fluid communication with the fluidic inlet;

wherein the vacuum source is adapted to evacuate a gas from the plurality of separation columns.

14. The system of claim 13 wherein the gas comprises air.

15. The system of claim 13 wherein the separation media comprises packed or microporous stationary phase material.

16. The system of claim 13 wherein the device further comprises a hydrophobic frit material.

17. The system of claim 13 wherein the liquid is an organic solvent selected from the group consisting of acetonitrile, methanol, isopropyl alcohol, ethanol, ethyl acetate, and dimethyl sulfoxide.

18. The system of claim 13, further comprising an inlet valve disposed between the positive pressure source and the fluidic inlet.

19. The system of claim 13, further comprising at least one outlet valve disposed between the vacuum source and the plurality of fluidic outlets.

20. The system of claim 13 wherein the vacuum source comprises a vacuum pump.

21. The system of claim 13 wherein the positive pressure source comprises a liquid pump.

22. The system of claim 13 wherein the positive pressure source is adapted to supply liquid pressurized to at least about 100 psi.